RUSALKA PLANITIA QUADRANGLE (V-25), VENUS: EARLY RESULTS

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Introduction: The V-25 quadrangle (15 to 18 E., 0 to N.) shows volcanism at all scales, from extensive corona-sourced flows through moderately sized shield volcanoes to small volcanic cones, all of which interact with tectonic elements of the planitia, such as wrinkle ridges, lineaments (presumed fractures), deformation belts and broad scale topography.

Methodology: Initial mapping is compiled digitally on a 225-meter/pixel image base derived from the FMAP dataset, to which synthetic stereo and Magellan geophysical data have be geographically referenced and linked for easy access. Additional image processing and analysis of the high-resolution FMAP images is carried out with IMAGE SXM freeware.

The mapping philosophy is similar to that employed in the Diana Chasma quadrangle (V-37) immediately to the south [1, 2]. Mapping follows USGS guidelines, with the caveats outlined [3].

Preliminary results: The earliest regional structural suite comprises NE- to NNE-trending subtle lineaments that fan out from the southwest corner of the quadrangle.

A network of wrinkle ridges deforms most definable material units (including large coronal outflows) that lie below mean planetary radius. Some wrinkle ridge sets that occur on younger units trend parallel to the aforementioned lineaments, indicating contractional reactivation of the earlier, shallowly buried structures [2].

Two corona associated flows dominate the quadrangle: the Llorono Planitia flows filling the northwest corner of V-25 (associated with Ituana Corona), and the Rusalka Planitia flows in the south-central area of the map (associated with the "stealth" coronae of Zaryanitsa Dorsa). Both units are clearly confined by observed regional topography. However, retreating lava "shorelines" in the Llorono Planitia group, and topographic arch development within the Rusalka Planitia group flows indicate enhancement of the region's topography occurred during and after emplacement of these units.

Crater scarcity makes them useless for dating units within the context of this map [3]. Figure 1 shows a very simplified composite of geomorphic units in the Rusulka Planitia region—NO temporal correlation of units is implied.

Conclusions: Reconnaissance mapping in V-25 indicates that coronae resurfaced the planitia. Tectonically, a radiating pattern of lineaments predates a topographically (but not stratigraphically) confined wrinkle ridge network, consistent with patterns mapped to the south. Topography has been enhanced over the time period recorded by the mapped units.

Currently we are developing an integrated geological history for both V-37 and V-25.

Note: IMAGE SXM macros used for processing the map base data are available at http://www.geology.smu.edu/~tectonics/young.html

References: [1] DeShon H.R. and Hansen V.L. (1998) LPS XXVIII, #1438, DeShon H.R. and Hansen V.L., Diana Chasma (V-37), USGS map, in review, [2] DeShon H.R. et al. (2000) JGR 105, 6983-6995, [3] Hansen V.L. (2000) Earth Planet. Sci. Lett., 176, 527-542, [4] Campbell B.A. (1999) JGR 104, 21951-21957.

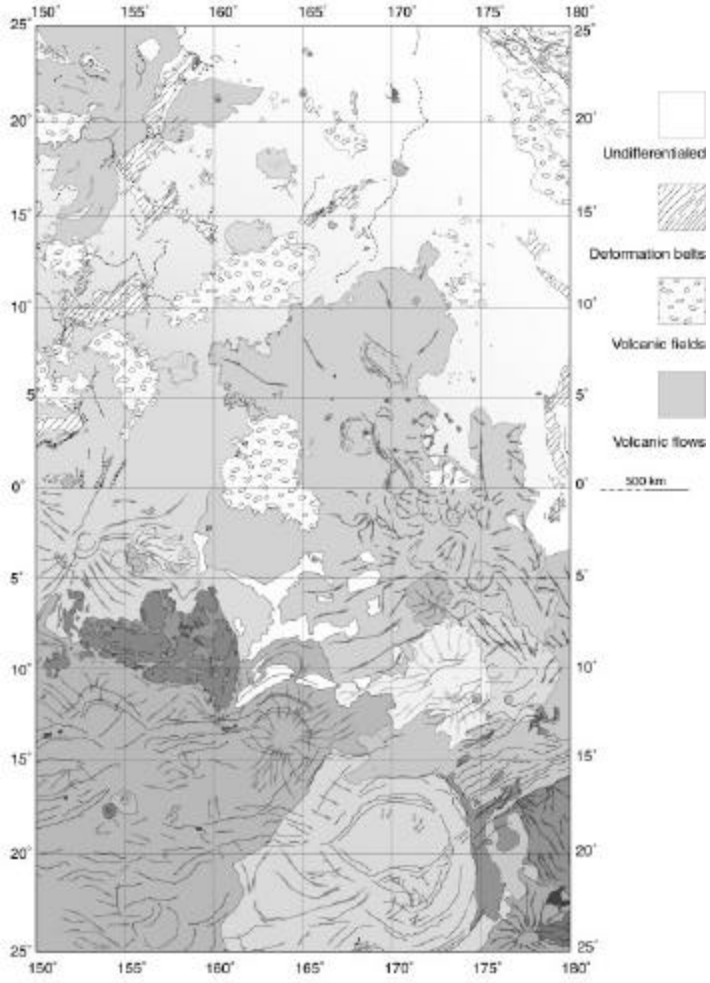

Figure 1. Simplified composite map of Rusulka Planitia region to date. From V-37 [DeShon and Hansen, in review] and V-25 [Young and Hansen, in progress]. V-25 comprises northern half.